DOCUMENT RESUME

ED 286 466 IR 012 798

AUTHOR Robinson, Louise; And Others
TITLE Let the Computer Introduce Itself to Education Majors.
PUB DATE Feb 87
NOTE 18p.; Paper presented at the Annual Meeting of the Association of Teacher Educators (Houston, TX, February 15-18, 1987).
PUB TYPE Information Analyses (070) -- Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Comparative Analysis; *Computer Assisted Instruction; *Computer Literacy; Course Content; Higher Education; Microcomputers; *Preservice Teacher Education; Pretests Posttests; Questionnaires; Student Attitudes

ABSTRACT

The effectiveness of a computer-assisted system to deliver an introductory course on educational computing to preservice elementary and early childhood teachers was investigated in this study. The 33 subjects enrolled in a one-hour Computer Literacy for Teachers course during the spring semester 1986 at Indiana University of Pennsylvania, worked in pairs and received 15 hours of instruction via an Apple IIc microcomputer. The Minnesota Computer Literacy Awareness Assessment (MCLAA) was used as both a pretest and a posttest to measure both affective items, such as enjoyment, anxiety, efficacy, education, social values, and technical values, and cognitive knowledge of hardware, software, programing, computer applications, and their impact. A 10-item questionnaire about the class was also administered to the subjects after the posttest. Analysis of the MCLAA results showed a significant difference between the mean scores on the pre- and posttests on every component except social values, and there was a substantial change in the affective total, cognitive total, and overall total between the two tests. Responses to the questionnaire were idiosyncratic and did not identify any common areas of concern. All of the students considered themselves computer literate at the end of the course. Statistical analyses are presented in three tables and a list of 10 references is provided. (Author/MES)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED286466

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Let the Computer Introduce Itself to Education Majors

Louise Robinson, Vincent Mikkelsen,

and Deborah Ellermeyer

Indiana University of Pennsylvania

Paper Presented at the Annual Meeting of the Association of Teacher Educators, Houston, Texas, February, 1987.

Running head: LET COMPUTER INTRODUCE ITSELF TO EDUCATION MAJORS

IR012794

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Louise Robinson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

BEST COPY AVAILABLE

Abstract

This study investigated the effects of a computer-assisted introduction to educational computing course upon the computer literacy of preservice elementary and early childhood teachers. Fifteen hours of instruction, 1 hour per week, were delivered via an Apple IIc microcomputer. Computer literacy was measured by the Minnesota Computer Literacy Awareness Assessment (MCLAA). The results indicated that the CAI course had a significant effect upon the computer literacy of the preservice teachers. It appears as though an immediate "quick fix", until courses of study can be changed and implemented, for preparing teachers to teach in classrooms with computers may be a CAI course.

Dr. Donald Michael (1968) wrote in The Unprepared Society that there is a growing separation between those working creatively with computers and the rest of the population Michael (1968). He said, "Ignorance of computers will render people as functionally illiterate as ignorance of reading, writing and arithmetic." In 1987, it is difficult to understand that colleges and universities are graduating students without a computer literacy requirement. Currently, Indiana University of Pennsylvania (IUP) is in the process of adopting an updated general education package that will probably include a computing component for all undergraduate students.

As the number of microcomoputers available to students in grades K-12 continues to grow, many preservice educators are concerned about the answer to the question, "Who's teaching the teachers about computing?" Abernathy and Pettibone (1984) reported that institutions in more than half the country already offer a computer literacy program for student teachers Abernathy and Pettibone (1984). Nearly one-quarter of the nation plans to have computer literacy as a teacher requirement. Currently, Pennsylvania does not have such a requirement for certification, nor does IUP require an educational computing course or competency for

graduation or certification.

Despite the growing presence of computers in U.S. schools and colleges, computer-based learning remains a very small fraction of the total instructional system. Most learning is still taking place through the passive learning modes that have dominated education: books and lectures. For this situation to change, trained teachers need to initiate drastic measures that will impact on the current delivery system. The key words here are "trained teachers". Second, behind hardware acquisition, teacher training is an important issue that must be addressed by all who are asking, "Will education be different (better) in the year 2000 (Peterson, 1984; Myers, 1984) (Myers, 1983; Peterson, 1984)?

Although computer hardware is in place and continues to be acquired at all levels of schooling, in about half of the elementary schools with microcomputers only one or two teachers, at most, are regular users (Becker, 1983) (Becker, 1983). Many surveys have been conducted to age the current status of microcomputer involvement in schools across the United States (Prentice, 1981; NIE, 1979; Braun, 1980) (Anonymous, 1979; Braun, 1980; Prentice, 1981) Nypaver (1983). Specifically, in the state of Pennsylvania, Nypaver (1983) found that 92% of the random sample of public

school teachers who have access to microcomputers for instructional purposes are not using them. The primary reason reported in both studies for lack of use was little or no teacher preparation for microcomputer implementation.

On the surface, it may seem that the obvious answer to the educators' concern for adequately preparing preservice teachers for educational computing integration is a required course for all education majors. It sounds simple enough, but ask anyone who has had the experience of trying to change a college curriculum about the difficulty of such a task. One of the first questions that is usually asked is, "What should be eliminated from our current list of required courses?" One could certainly suggest a few possibilities, but certainly not x or y because ... it's been done that way for a long time. Another concern that surfaced on the IUP campus was from the computer science department. They were concerned about overlap of course content and also wanted all computer courses in the College of Education to carry an undergraduate computer science prerequisite. In addition to these concerns, there is great variability in the computer skills of students. Some students have had a computer course in high school. Others have had a strand of

computing in a mathematics course, or own a personal computer.

As a result of the above mentioned concerns and an IUP Creative Teaching Grant, a one-credit computer assisted introduction to educational computing course, Computer Literacy for Teachers, was piloted in the Spring of 1986.

Problem

The purpose of this investigation was to determine if a computer-assisted delivery system was effective in improving the computer literacy of preservice elementary and early childhood teachers.

Method

The subjects for the study were 33 preservice elementary and early childhood teachers who enrolled themselves in a one-hour Computer Literacy for Teachers course during the spring semester, 1986 at IUP.

All subjects met with the professor of record on the first day of the semester. This first session included an overview of the course, pairing and scheduling of students, and the administration of the pretest. Computer laboratory assistants were instructed about the appropriate interactions with the students who were enrolled in this course.

Students worked in pairs. They selected a one-hour

block of time that remained their computer time for the duration of the semester. The students received all of their instruction via the computer. The course content is outlined in Table 1. The students were introduced to both Logo and BASIC. They explored different types of software, evaluated it, and word processed their evaluations. The students had an assignement to hand in at the conclusion of each session. Student participation was monitored by a variety of record keeping devices as well as a brief individual meeting with the professor once every two weeks. In addition to the two testing sessions, the students worked at the computer for 13 one-hour sessions.

Table 1

Computer Literacy for Teachers - Session Outline

Session	Content
1	Overview and Pretest
2	Apple - An Introduction The Apple at Play
3	Apple - The Inside Story Exploring Apple Logo
4	For Teachers Only - Lessons 1-4
5	For Teachers Only - Lessons 5-8
6	Apple - Getting Down to BASIC
7	Bank Street Writer - Tutorial
8	Bank Street Writer - Practice
9	MousePaint - Tutorial
10	Logo - Drawing, Saving, Printing Graphics
11	Logo - Procedure Writing and Printing
12	Printshop
13	Software Evaluation and MECC Software
14	Simulation Software
15	Posttest and Questionnaire

The Minnesota Computer Literacy and Awareness Assessment (MCLAA) instrument was used to measure computer literacy. The MCLAA was used as both the pre and posttest. The Morsund (1975) definition of computer literacy is the one that was used for this investigation Morsund (1975). "The knowledge of the nontechnical and low-technical aspects of the capabilities and limitations of computers, and of social, vocational, and education implications of computers." The MCLAA is an 83 item test that measures both affective (30) items and cognitive knowledge (53 items) with regard to computers. The following attitudes and values were measured by the affective subscale: enjoyment, anxiety, efficacy, education, social values, and technical values. The cognitive subscale measured knowledge of: hardware, software, programming, application, and impact.

In addition to the MCLAA, a ten-item questionnaire about the course was also administered to the subjects after the posttest.

Results

Table 2 reports the pre and posttest means, standard deviations, and t scores for each component of the MCLAA. There was a significant difference between pre and posttest means of every component except social

values. There was a substantial change in the affective total, cognitive total, and overall total from pre to posttesting.

The results of the 10 item questionnaire are reported in Table 3. Three of the items, which were open-ended, asked students to identify the one characteristic they liked best and least about the course, and to recommend changes in the course. The responses to these questions were idiosyncratic and did not identify any common areas of concern, therefore, these results are not reported.

One hundred percent of the students considered themselves computer literate at the end of the course, indicated that they would enroll again if given the opportunity, and would recommend the course to a friend. Ninety-seven percent of the students said they would like to take other CAI courses and would like to see the professor develop more courses like this one. Most of the students, 85%, enjoyed working with a partner, while 15% would have preferred working alone. When asked about the amount of content that was covered in the course, 21% indicated that there wasn't enough content covered while 79% felt just the right amount was offered.

Table 2

Computer Literacy Attainment For CAI Group (N=33)

Component	Pretest		Posttest		
	M	s	M	s	t
Enjoyment (25)	20.09	3.2	21.75	2.4	-3.38**
Anxiety (25)	15.94	3.8	20.33	4.2	-6.59***
Efficacy (25)	15.54	3.0	19.42	2.8	-8.67***
Education (25)	20.91	3.0	23.00	2.0	-2.09*
Social Values (15)	14.27	.9	14.48	.7	-1.42
Technical Values (15)	12.42	1.8	12.97	1.8	-1.96*
Affective Total (130)	100.18	10.8	111.84	9.7	-7.35***
Hardware (8)	4.12	1.9	6.24	1.2	-6.65***
Software (8)	4.72	1.9	7.06	.9	-6.47***
Applications (15)	11.12	2.2	12.91	1.7	-3.43**
Impact (15)	10.42	1.9	12.36	2.2	-4.31***
Programming (7)	2.63	1.4	4.18	1.4	-5.68***
Cognitive Total (53)	32.03	7.4	42.76	4.9	-7.47***
Total (183)	133.21	12.8	154.26	9.9	-10.37***

[1]Numbers in parentheses represent the most favorable attitudes on the affective subscale and maximum achievement on the cognitive subscale.

* = $p < .05$
** = $p < .01$
*** = $p < .001$

Table 3

Computer Literacy for Teachers - Questionnaire Results

Question	%Response	
1. Do you feel that you are computer literate as a result of this course?	100% Yes	0% No
2. If you had it to do over again, would you enroll in this course?	100% Yes	0% No
3. Would you like to take other courses via CAI?	97% Yes	3% No
4. Did you enjoy working with a partner or would you have preferred to work alone?	85% Partner	15% Alone
5. Would you recommend this course to a friend?	100% Yes	0% No
6. The amount of content that was covered in this 1-credit course was:	21% Not enough 79% Just enough	0% Too much
7. I would like to see Dr. Robinson create more courses like this.	97% Yes	3% No

Discussion

One concern that many people have about computers in education is the possible dehumanizing effect they may have on students. This concern is supported by visions of students sitting in front of computers with earphones on and receiving instruction from a machine. During this 15 week study, the subjects received all of their instruction from the computer and the data indicate that a computer assisted delivery system was effective in improving the computer literacy of preservice elementary and early childhood teachers. The students worked in pairs assisted each other as they worked through each session. They communicated freely for each hour session that was logged. In addition to that support, the students had to report to the professor once every two weeks. During these brief meetings (usually less than 5 minutes) the students shared questions, concerns, or antidotes about the course. Not only was the computer assisted delivery system effective in developing a competent computer user as defined by the MCLAA instrument, but the students also indicated that they enjoyed it, and would like to have the option of taking more courses like this one.

Since changing college curriculum is so difficult and time consuming, the Professional Studies in

Education Department at IUP is considering offering this course as an elective on a continuing basis. This course could serve two functions. First, it could be an opportunity for all education majors to become at least minimally computer literate before graduation. This could happen because it is only a one credit course and can be scheduled at the student's convenience. Second, this course could be used as a prerequisite to the three credit educational computing course that will be required in the future. If all students had at least a minimal level of literacy entering the three credit course, most of the introductory content could be replaced with more indepth exploration of other topics.

For reprints or lesson plans, send request to Dr. Louise Robinson, Department of Professional Studies in Education, 322 Davis Hall, IUP, Indiana, PA 15705-1087

References

Abernathy, S. M., & Pettibone, T. J. (1984). Computer literacy and certification: what states are doing. T.H.E. Journal, 12(4), 117-119.

Anonymous. (1979). Computers in education study. Washington, D.C.: National Institute of Education. (Project No. 28-16 Report WIC-E-79-3, August)

Becker, H. J. (1983). School uses of microcomputer reports from a national survey. Center for Social Organization of Schools, The Johns Hopkins University, Issue No. 1, April, and Issue No. 2, June.

Braun, L. (1980). Computers in learning environments. BYTE, 5, 7-10; 108-114.

Michael, D. N. (1968). The underprepared society. New York: Basic Books.

Morsund, D. (1975). What is computer literacy? Oregon Council for Computer Education, 2(2).

Myers, D. (Ed.). (1983). Run: Computer Education. D.D. Harper & J. H. Stewart. Monterey, CA.

Nypaver, B. A. (1983). School and teacher characteristics, materials, use and attitudes as they relate to microcomputers in classroom settings in the state of Pennsylvania. Pittsburgh, PA: Unpublished

doctoral dissertation.

Peterson, D. (1984). Will education be different (better in the year 2000? Popular Computing, 3(13), 10-18.

Prentice, L. R. (1981). Educational computing - the giant awakes. Microcomputing, 5, 86-90.